# Acacia Miscellany 4. Three new Western Australian species with affinities to A. wilhelmiana (Leguminosae:Mimosoideae: Section *Plurinerves*) from Western Australia.

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#### Abstract

B.R. Maslin, Acacia Miscellany — 4. Three new Western Australian species with affinities to A. wilhelmiana (Leguminosae:Mimosoideae: Section Plurinerves) from Western Australia. Nuytsia 7(2): 221-228 (1990). Descriptions are provided for three new Western Australian species of Acacia, namely, A. ascendens, A. brachypoda and A. cowaniana. These species, together with seven close relatives, are referred to the informal "A. wilhelmiana group". A key is presented to the ten species of this group.

#### Introduction

The main purpose of this paper is to describe three new Western Australian species for inclusion in the forthcoming Acacia volume of Flora of Australia. These species, together with seven close relatives, are here referred to informally as the "Acacia wilhelmiana group". The 10 species assigned to this group are: A. abrupta Maiden & Blakely, A. ascendens Maslin sp. nov., A barattensis J. Black, A. brachypoda Maslin sp. nov., A. cowaniana Maslin sp. nov., A. gracilifolia Maiden & Blakely, A. helmsiana Maiden, A. menzelii J. Black, A. viscifolia Maiden & Blakely and A. wilhelmiana F. Muell.

Most species of the "A. wilhelmiana group" occur in the semi-arid areas of south-west Western Australia and south-east South Australia. However, A. wilhelmiana ranges from South Australia into Vietoria and New South Wales. Also, A. abrupta and A. helmsiana occur in the Arid Zone of Western Australia and Northern Territory, with the latter species extending to South Australia. Distributions for the above species, except the three new ones, are shown in Maslin & Pedley (1982).

Species of the "A. wilhelmiana group" are shrubs or small trees which share most or all of the following characters: (1) plants resinous and/or viseid to some degree; (2) phyllodes excentrically mucronulate, often incurved, longitudinal nerves distant and commonly obscure, lateral nerves

absent; (3) peduneles 1 or 2 per axil and often inserted on very short raeemes (axes 1-5 mm long); (4) basal peduncular bracts solitary and persistent or (in *A. abrupta* and sometimes in *A. ascendens* and *A. helmsiana*) absent; (5) flower-heads globular or almost so; (6) flowers 5-merous (4-merous in *A. barattensis*); (7) calyx gamoscpalous (although deeply dissected in *A. ascendens*, *A. helmsiana* and *A. menzelii*); (8) legumes usually firmly chartaceous; (9) seeds longitudinal.

The "A. wilhelmiana group" is not readily accommodated in either Bentham's (1864) or Pedley's (1978) classifications of Acacia. This is because for phyllodinous species with globular flower-heads, these systems rely on the number of nerves per phyllode to ascribe species to either section *Phyllodineae* or *Plurinerves*. In the "A. wilhelmiana group" this is a variable character with the number of nerves varying from two to more than seven per phyllode, i.e.

2 nerves per phyllode: A. helmsiana
4 nerves per phyllode: A. abrupta, A. ascendens, A. brachypoda
3 to 7 nerves per phyllode: A. cowaniana
5 or more nerves per phyllode: A. wilhelmiana
5 or 7 nerves per phyllode: A. viscifolia
6 nerves per phyllode: A. menzelii
8 nerves per phyllode: A. barattensis

This is but one of many examples that demonstrates the need to reassess the classification of *Acacia* subgenus *Phyllodineae* in order to produce a scheme which better reflects natural groupings of taxa.

# Key to species of "A. wilhelmiana group"

# 1. At least some phyllodes 5-10 em long

2. Flowers 4-merous; phyllodes compressed, obseurely 3-nerved per face (S.A.)
2. Flowers 5-merous
3. Peduneles glabrous; phyllodes terete, 4-nerved (W.A., N.T.)
<ol> <li>Gland at base of phyllode 0-2 mm above the pulvinus; sepals united; legumes 2.5-3 mm wide (W.A., N.T.)</li></ol>
4. Gland absent from base of phyllode; sepals ± free; legumes 5 mm wide (W.A.) A. ascendens
<ol> <li>Peduncles puberulous; phyllodes ± eompressed, &gt;4-nerved in all (ineluding marginal nerves)</li> </ol>
<ol> <li>Peduncle indumentum not prominent, hairs white; some or all phyllodcs &gt;6.5 cm long, phyllodes longitudinally grooved on each face (S.A.)</li></ol>
<ul> <li>5. Peduncle indumentum prominent, hairs light golden;</li> <li>few phyllodes to 6.5 cm long,</li> <li>the remainder shorter (S.A.).</li> <li>A. wilhelmiana (Flinders Range variant)</li> </ul>
. All phyllodes 1-5 em long

6. Phyllodes flat (although often somewhat thick)

7. Phyllodes 2-nerved or more per face
8. Heads ± cream; peduncle indumentum obscure; phyllodes (2)3-5 cm long, 1-2.5 mm wide. (W.A.)
8. Hcads golden (S.A., Vic., N.S.W.)
<ol> <li>Peduncles with a conspicuous, dense, light golden pubescence; phyllodes 1-3 cm long, 1-4(6) mm wide</li></ol>
9. Peduncles glabrous; phyllodes 1.5-4 cm long, 0.5-1 mm wide A. menzelii
7. Phyllodes 1-nerved per face
10. Peduncles 2-3 mm long; flowcrs 8 or 9 per head; phyllodes 2-5 cm long (W.A.)
10. Peduncles 5-15 mm long; flowers 20-30 per head; phyllodes 0.5-2 cm long (W.A., N.T., S.A.)
6. Phyllodes terete to sub-terete
11. Flowers 8 or 9 per head; peduncles 2-3 mm long; phyllode apices eglandulose (W.A., rare)
11. Flowers >10 per head; peduncles usually >3 mm long
12. Flowering peduncles glabrous
13 Phyllodes 6-nerved, apices eglandulosc; branchlet apices sparsely puberulous (S.A.)
<ol> <li>Phyllodes (obscurely) 2- or 4-nerved, with a small gland adjacent to mucro (observe at x10 mag); branchlets glabrous</li> </ol>
14. Phyllodes 0.5-2 cm long, 2-nervcd, base eglandulose. (W.A., N.T., S.A.)
14. Phyllodes 2-5 cm long, 4-nerved
15. Gland at base of phyllode 0-2 mm above the pulvinus; sepals united; legumes 2.5-3 mm wide (W.A., N.T.)
15. Gland absent from base of phyllode; sepals ± frce; legumes 5 mm wide (W.A.) A. ascendens
<ol> <li>Flowering peduncles and branchlet apices puberulous (indumentum sometimes minute, sparse and imbedded in resin)</li> </ol>
16. Peduncles with a prominent, dense, light golden pubescence; branchlets commonly with prominent yellow ribs at extremities (S.A.,Vic., N.S.W.)
<ol> <li>Peduncles sparsely pubescent, hairs white and/or golden; branchlets not obviously ribbed (W.A.)</li></ol>

# Taxonomy

Acacia ascendens Maslin, sp. nov.

*Frutices* glabri ad 2(3) m alti, apicibus vegetativis novis resinosis et leviter viscidis. *Phyllodia* teretia, 2-4 cm longa, 1 mm diametro, incurvata vel solum ad basem incurvata et aliter recta, saepe truncata vel obliquo-truncata, excentrice mucronulata, inclinata ad ascendens, viridia, 4-nervata, nervis brunneolis, leviter impressis viscidisque, exsudata saepe cristam angustam translucidam formanti; glande juxta mucronem. *Pedunculi* 5-14 mm longi, plerumque 1 vel 2 in racemis axillaribus vel terminalibus ad 5(10) mm longis dispositis; capitula globularia, dense 20-25-Iloribus, aurea, resinosa. *Flores* pentameri, sepalis ad basem connatis. *Legumina* (submatura) angusto-oblonga, ad 7 cm longa, 5 mm lata, plana, leviter undulata, resinosa. *Semina* (submatura) longitudinalía, oblongo-elliptica, arillo clavato.

# Typus: Chiddarcooping Nature Reserve, Western Australia, 23 July 1989, *B.R. Maslin* 6382 (holo: PERTH; iso: AD, B, BM, BRI, CANB, G, K, MEL, MO, NSW, NY, PERTH, Z).

Moderately dense, ± obconic shrubs to 1.5-2 m tall, sometimes 3 m, single-stemmed or several-branched at ground level. Bark mid-grey, smooth except furrowed at base of old stems. *New shoots* resinous, slightly viscid, pale green or light bronze. *Branchlets* terete, obscurely ribbed, glabrous, resinous and brown at extremities. Stipules semi-persistent, narrowly triangular, inconspicuous, c. 0.5 mm long, 0.1-0.2 mm wide, dark brown. Phyllodes ± terete, (1)2-4 cm long, a few to 6 cm long, c. 1 mm wide, inclined to ascending, erect when young, incurved or  $\pm$  straight but incurved at base, occasionally ± sigmoid, glabrous, green, stomata numerous (observe at x10 mag.); 4-nerved, nerves brownish and slightly impressed, resinous, the exudate commonly forming a narrow translucent ridge; apices often uncinate to subuncinate, excentrically mucronulate, often obliquely truncate; *pulvinus* obscure,  $\leq 0.5$  mm long,  $\pm$  smooth, yellow to pale orange. Gland situated on upper margin of phyllode adjacent to the mucro, circular, 0.3-0.4 mm diameter, base eglandulose. *Inflorescences* situated at ends of branchlets, comprising short terminal and/or axillary racemes or axillary peduncles. Terminal racemes growing out at anthesis, the peduncles subtended abaxially by a terete, acute prophyll which is c. 1 mm long and flanked by a pair of stipules. Axillary racemes to 5(10) mm long, 1- or 2-headed, terminated by a vegetative bud which occasionally grows out during anthesis, base of raceme axis ebracteate, the peduncles subtended abaxially by a minute persistent, triangular, brown bract c. 0.5 mm long or with prophyll and stipules as on terminal racemes. Peduncles 5-14 mm long, glabrous; basal peduncular bracts absent (when inflorescences are non-racemose) or solitary (on axillary racemes) or replaced by a prophyll (on terminal and axillary racemes). Flower-heads globular, 12 mm diam. (fresh), 6 mm diam (dry), golden, resinous, densely 20-25-flowered. Bracteoles ± spathulate, 1 mm long, glabrous. Flowers 5-merous. Sepals united at base, narrowly oblong to broadly spathulate, claws translucent, laminae yellow, ± concave and slightly thickened abaxially. Petals 1.7 mm long, glabrous, very obscurely nerved. Legumes (slightly immature) narrowly oblong, to 7 cm long, 5 mm wide, straight, flat, slightly undulate, not reticulate, resinous, glabrous. Seeds (slightly immature) longitudinal in the legume, oblong-elliptic; areole open towards hilum; funicle 12 mm long, expanded into a clavate aril.

Other specimens examined. WESTERN AUSTRALIA: Chiddarcooping Nature Reserve, S.D. Hopper 6405, 6407, 6408-6412, 6414 (all PERTH) and A.S. Weston 14029 (BM, G, NT, PERTH), 14103 (AD, BRI, CANB, K, MEL, NSW, PERTH), 14170 (PERTH), 14263 (PERTH, MO, NY), 14263A (PERTH), 14546 (PERTH).

*Distribution.* South-west Western Australia in the Avon Botanical District (1:250,000 map H50-12). Known only from the Chiddarcooping Nature Reserve, about 70 km NE of Merredin.

Habitat. Scree slopes of granitic breakaways in woodland or low scrub.

*Flowering and fruiting.* Flowers June—September. Legumes with slightly immature seeds occur in early November.

Affinities. On account of its short, terete, 4-nerved phyllodes with an apical gland and its overall inflorescence characters, A. ascendens is most closely related to the widespread southern Arid Zone

species *A. abrupta.* Both species are glabrous, resinous shrubs. *Acacia abrupta* is readily distinguished from the new species in the following ways: phyllode nerves lacking ridges of translucent, viscid material; gland present at base of phyllode as well as the apex; sepals united for c. 2/3 their length; legumes 2.5-3 mm wide, areuate, biconvex, shallowly constricted between seeds, longitudinally reticulate.

*Conservation status.* 2RC using the criteria of Briggs & Leigh (1988). The species is locally abundant in suitable habitats within the Chiddareooping Nature Reserve.

*Etymology.* The specific epithet refers to the characteristic phyllode orientation.

Acacia brachypoda Maslin, sp. nov.

*Frutices* densi leviter resinosi-aromatici ad 2 m alti. *Ramuli* glabri, nervis latis, luteis vel viridibus. *Phyllodia* teretia ad plana, 2-5 em longa, 1 mm lata, oblique truncata et excentrice mucronulata, viridia, glabra, obscure 4-nervata, 1-nervata ubi plana, pulvino minuto sed distincta, glande obscura, circa 0.5 mm supra pulvinum, phyllodiorum apicibus eglandulosis. *Pedunculi* 2-3 mm longi, 2 in quoque axilla, aliquando in racemo ad 1 mm longo, appresso-puberuli, bractea basali lutea, capitulis globularibus, aureis, 8- vel 9-floribus. *Flores* pentameri, calyce gamosepalo, petalis uninervatis. *Legumina* arcuata et undulata ad irregulariter circinnata vel non arcuata, ad 8 cm longa, 7-8 mm lata, tenuiter coriaceo-crustacea. *Semina* longitudinalia, oblonga ad oblongo-ovata, 4 mm longa, arillo crasso.

*Typus.* 13.5 km N of Brookton on the road to Beverley, Western Australia, 26 May 1976, *B.R. Maslin* 4088 (holo: PERTH; iso: CANB, K, NY).

Dense, round, slightly aromatic shrubs to 2 m tall, dividing near ground level into many spreading to erect stems. Bark fissured at base of old stems otherwise smooth and grey except upper branches which are often brownish. New shoots resinous, slightly viscid, pale green. Branchlets glabrous, terete except angled at extremities, roughened by raised stem-projections where phyllodes have fallen, marked with broad (0.3-0.4 mm wide) flat, shiny nerves, at branchlet apices the nerves green (drying yellow) and elose together, with age turning brown, widely spaced and more prominent. Stipules eadueous, triangular, minute, 0.3-0.5 mm long, thick. Phyllodes terete, sub-terete or flat, 2-5 em long, 0.7-1 mm wide, finely longitudinally suleate when dry, patent to inclined or ascending to erect, straight to shallowly incurved, slightly shiny, glabrous, green; 4-nerved, 1-nerved per face when flat, nerves impressed and obscure, brownish when dry, sometimes overlaid by an irregular narrow ridge of translucent resin; *apices* not uncinate, obliquely truncate, ending in a very short, acute, excentric muero; pulvinus very reduced, 0.2-0.5 mm long, narrower than phyllode width, yellowish. *Gland* not prominent, situated on a slight, rounded angle e. 0.5 mm above pulvinus, apiees eglandulose. Inflorescence parts resinous, not viscid. Peduncles 2-3 mm long, 2 per node with a vegetative bud (enveloped by resin) arising from within their angle, sometimes inserted on an extremely short raceme to 1 mm long, antrorsely appressed puberulous, hairs white and partially or wholly enveloped by resin; basal peduncular bract solitary, persistent, triangular, c. 0.5 mm long, somewhat thickened, yellow. *Flower-heads* prolific, globular, resinous, mid-golden, 8- or 9-flowered. Bracteoles sub-sessile; laminae triangular-ovate, c. 0.5 mm long and the same across, resinous, slightly auriculate at base, sparsely appressed puberulous abaxially, hairs light golden. Flowers slightly resinous, 5-merous. Calyx c. half length of corolla, gamosepalous, turbinate, shortly divided into broadly triangular lobes; calyx tube  $\pm$  obseurely 5-nerved, antrorsely appressed-puberulous, hairs white on lower half, light golden on upper half. *Petals* c. 2.5 mm long, free, sparsely appressed-puberulous (hairs obscured by resin), midribs rather prominent. Legumes (mostly dehisced) to c. 8 em long (expanded length), 7-8 mm wide, narrowly oblong, curved and/or undulate to irregularly eireinnate, valves commonly irregularly coiled and twisted following dehiscence, not or scarcely constricted between seeds and somewhat raised over them, firmly chartaceous to thinly coriaceous-crustaceous, resinous, glabrous, mid-brown. Seeds (few seen) longitudinal in the legume, oblong to oblong-ovate, 4 mm long, 2.5-3 mm wide, compressed (1-1.5 mm thick), dark brown, moderately shiny, *pleurogram* obscure; *areole* elongated "U"-shaped, open

towards the hilum, 2-2.5 mm long, c. 0.8 mm wide; *funicle* filiform c. 1 mm long, expanded into a thick terminal yellow-brown (when dry) *aril* c. 2 mm long.

Other specimens examined. WESTERN AUSTRALIA: Darkin Swamp, J.S. Beard 8130 (PERTH), R.J. Edmiston 2 (PERTH) and B.R. Maslin 6331 (PERTH); between Beverley and Brookton, B.R. Maslin 6342 (AD, BRI, CANB, CBG, G, K, MEL, MO, NSW, NY, PERTH, Z)

*Distribution.* South-west Western Australia on the border of the Darling and Avon Botanical Districts (1:250,000 map 15O-2). Known only from two populations between Brookton and the headwaters of the Darkin River.

*Habitat.* Low-lying seasonal swampy areas on sandy clay or loam in Open Scrub (Darkin Swamp), or low sandy loam rises in Open Woodland adjacent to slightly saline flats (near Brookton).

*Flowering and fruiting period.* Flowering commences in late May near Brookton but about a month later at Darkin Swamp. Because of the paucity of collections it is not known when flowering ends. Neither is it known when seed first matures, however, some legumes (a few with seeds remaining) can be found on the plants during at least May and June. Judging from the large quantity of dehisced legume valves on the ground under the plants, this species has a high fecundity.

*Affinities.* The new species is readily distinguished from other members of the "*A. wilhelmiana* group" by its very short peduncles and few-flowered heads. Other characters useful in recognizing *A. brachypoda* include the following: branchlet nerves broad and flat, phyllodes (obscurely) 4-nerved, pulvinus narrower than the width of phyllode, calyx turbinate and very shortly dissected, petals rather prominently 1-nerved, legumes broad.

Conservation status. 2V using the criteria of Briggs & Leigh (1988).

*Etymology.* The specific epithet refers to the characteristic short peduncles.

Acacia cowaniana Maslin, sp. nov.

*Frutices* vel arbores ad 5(8) m alta, ramulis glabris vel subglabris. *Phyllodia* linearia, attenuata versus basem, uncinata ad subuncinata et excentrice rostellata, (2)3-5 cm longa, 1-2.5 mm lata, 1: w = 10-46, patens ad inclinata, leviter incurvata, plana nervis aliquibus appresso-puberula vel laminis omnino glabris, viridia, in quoque superficie obscure 3-7 nervata, glande basali. *Racemi* 2-3 mm longi, pedunculis (1)2 in quoque axilla 5-7 mm longis, sparse ad parce appresso-puberulis; capitula globularia, cremea ad diluto-citrina, 20-floribus. *Flores* pentameri; calyce gamosepalo. *Legumina* linearia, ad 8 cm longa, 4.5-6 mm lata, firme chartacea, leviter undulata, villosa vel puberula, maturitate pilis decrescentibus. *Semina* longitudinalia, oblongo-elliptica ad oblongo-ovata, c. 3.5 mm longa, interdum ad 5 mm longa, arillo clavato.

*Typus.* Mount Caroline (eastern slopes), 21 km due SSW of Kellerberrin, Western Australia, 10 April 1986, *B.R. Maslin* 6015 (holo: PERTH; iso: CANB, K, NY).

Shrubs or small trees to 5 m tall, occasionally to 8 m, dividing at or near ground level into a few main trunks. Bark grey, fibrous and longitudinally fissured on main trunks (at least at their bases), smooth and grey-red or reddish brown on upper branches. Branchlets terete, angled at extremities, obscurely ribbed, glabrous or sparsely antrorsely puberulous, hairs white or golden and mainly confined to the ribs, ribs commonly flanked by an irregular, slightly raised line of yellowish sub-epidermal material (? resin) which is  $\pm$  continuous at first but breaking into irregular tubercles with age. Stipules caducous, inconspicuous, triangular, c. 0.3 mm long. Phyllodes narrowly linear, narrowed at base, (2)3-5 cm long, 1-2.5 mm wide, 1:w = 10-46, flat, patent to inclined, mostly shallowly incurved, a few straight or shallowly sigmoid, resinous, glabrous or sparsely appressed-puberulous, hairs white or golden and confined to some nerves, green; obscurely

3-7-nerved per face, nerves distant, brownish and slightly impressed when dry, uniformly obscure (scarsely visible when fresh) or 2 per face yellowish and more pronounced than the rest, lateral nerves absent; apices sub-uncinate, rounded or occasionally obliquely truncate, excentrically rostellate; pulvinus c. 0.5 mm long, yellow or orange-brown and slightly transversely rugose when dry. Gland situated on upper margin of phyllode at distal end of pulvinus, circular or elliptic, c. 0.5 mm long, apices eglandulose. Racemes resinous, (1-)2-headed; raceme axes 2-3 mm long, compressed, shallowly channelled above, sparsely appressed-puberulous, hairs white or golden, base ebracteate, terminated by a vegetative bud. Peduncles 5-7 mm long, sparsely to moderately appressed-puberulous, hairs white or pale golden and commonly enveloped in resin; basal peduncular bract persistent, triangular-ovate, c. 0.5 mm long, light brown. Flower-heads globular, cream to very pale lemon yellow, 10 mm diam. (fresh), 4.5-7 mm diam. (dry), 20-flowered, resinous. Bracieoles spathulate, 1 mm long; claws linear, glabrous; laminae ± ovate, acute, inflexed, slightly thickened, sparsely appressed-puberulous. Flowers 5-merous, resinous. Calyx membranous, c. half length of corolla, gamosepalous, variably dissected to c. half its length into oblong or triangular, sparsely appressed-puberulous lobes, calyx tube glabrous. Petals 1.5-2 mm long, joined for 1/2-2/3 their length, glabrous or sparsely appressed-puberulous, obscurely 1-nerved. Legumes linear, to 8 cm long, 4.5-6 mm wide, firmly chartaceous,  $\pm$  straight to slightly curved, slightly undulate, rounded on opposite sides over alternate seeds, slightly resinous, light brown to mid-brown, villous or puberulous, hairs rather sparse with age. Seeds (few seen) longitudinal to longitudinally oblique in the legume, oblong-elliptic to oblong-ovate, mostly c. 3.5 mm long and 2 mm wide (perhaps slightly immature) but one measuring 5 mm long and 3 mm wide, tan, dull (small seeds) or sub-shiny (large seeds); *pleurogram* obscure; *areole* open towards the hilum, 1 mm long (small seeds) or 2 mm long (large seeds), 0.4-0.5 mm wide; *funicle* filiform, c. 1 mm long, expanded rather abruptly into a clavate, presumably white (commonly yellowish-brown when dry) *aril* extending c. 1/3 seed length.

Other specimens examined. WESTERN AUSTRALIA: Jilakin Rock, 2 May 1986, K.J. Atkins s.n. (PERTH); Mt Caroline, 15 May 1961, W.H. Butler s.n. (PERTH); Kellerberrin Hill, 2 July 1936, C.A. Gardner s.n. (PERTH); Mooranoppin Rock, C.A. Gardner 13887 (PERTH); Mt Caroline 5 April 1986, J. Kinnear s.n. (PERTH); Kellerberrin, September 1897, R.B. Leake, (PERTH); Jilakin Rock, 24 October 1959 and 10 August 1960, C.V. Malcolm s.n. (both PERTH); 8 km NE of Kellerberrin on "Shark Mouth" Rd, B.R. Maslin 589 (BRI, PERTH) and B.R. Maslin 589A (MEL, NSW, PERTH); Mt Caroline (eastern slope), B.R. Maslin 6015A (PERTH).

*Distribution and habitat.* South-west Western Australia in the Avon Botanical District (1:250,000 maps H50-15 and I50-03). Restricted to a few granite outcrops around Kellerberrin and Kulin. Besides the localities listed above, the species is also known from Nangeen Hill, south-east of Mt Caroline (B. Bromilow, pers. comm.).

Flowering and fruiting period. Flowers April-July. Legumes (slightly immature) in October.

*Affinities.* Related to the eastern Australian species *A. wilhelmiana* which is most readily distinguished by its flower heads goldencoloured, peduncle indumentum denser and more conspicuous, phyllodes usually shorter (1-3 cm long, rarely a few to 6.5 cm), gland 1-2 mm above pulvinus and legumes 2-3 mm wide and glabrous.

Conservation status. 3R using the criteria of Briggs & Leigh (1988).

*Etymology.* Named in honour of Richard Cowan in recognition of his major contribution to botanical bibliography through co-authorship (with F. Stafleu) of "Taxonomic Literature II" and in appreciation of the enjoyable collaboration since 1987 on the study of Australian acacias.

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